

## ABSTRACT

A metrology instrument is calibrated using two reference locations with different optical properties designed to produce different measurement results, e.g., different thicknesses. The metrology instrument, for example, may be an ellipsometer with a  
5 variable phase retarder. By comparing initial measurements of the two reference locations with later measurements of the two reference locations, the amount of calibration error can be easily determined. In addition, an ellipsometer having a spatially or temporally variable phase retarder may also be calibrated with a single reference location.

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